Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	272,064	209,342	405,508	425,417	895,091	1,202,485	1,674,699
R113 Ballistic Missile Defense Interceptor Block 2012	256,809	0	0	0	0	0	0
R213 Ballistic Missile Defense Interceptor Block 2014	0	201,933	386,300	400,000	851,900	1,149,000	1,651,018
0602 Program-Wide Support	15,255	7,409	19,208	25,417	43,191	53,485	23,681

Note: Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C).

The Agency transitioned the Space Test Bed Program (Project R216) to the Ballistic Missile Defense System Space Program (Project 0517, PE 0603895C).

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System Interceptors mission is to develop, test, and field land and sea-based interceptor capabilities within an integrated Ballistic Missile Defense System that are cost effective and have high mission assurance. The Missile Defense Agency will exploit the benefits of strategic interceptors deployment and mobility, early engagement, and distributed sensors to attack and defeat the adversary in new ways across the entire battle space. Our goal is to fill layered defense gaps, provide complimentary capabilities to existing and planned systems against the current threat, and provide a foundation for next generation systems to keep pace with the threat.

A.1 System Element Description

The Missile Defense Agency is developing a strategically deployable, land-mobile, multi-use (boost, ascent, and midcourse) Kinetic Energy Interceptor Element that consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. The interceptor design is compatible with both land-mobile and sea-mobile operations and features a high performance booster designed to carry multiple payload types. The program will leverage and build upon Ballistic Missile Defense System sensor and Command Control, Battle Management, and Communication capabilities. The Kinetic Energy Interceptor design adheres to new Agency quality, safety, environmental and mission assurance standards and contains several unique design features including: direct downlink of overhead infrared sensor data to a mobile weapon, advanced boost phase target tracking and prediction algorithms, a fast burning rocket motor, a high velocity at burnout with heavy payloads, and a large divert capability that enables early weapon commits.

The Kinetic Energy Interceptor near term program emphasis is on component capability risk reduction and element engineering. The Agency's goal is to mitigate critical risk areas prior to making full budget commitments. The performance, manufacturing, and cost knowledge we gain through FY08

knowledge point tests will drive investment decisions. The major knowledge point events include: 1) a campaign of real-time battle management and fire control tests with fully integrated Ballistic Missile Defense System Command, Control, Battle Management, and Communications and sensor capabilities to verify our quick response timeline and engagement sequences; and 2) a series of wind tunnel tests, booster first and second stage static firing tests and an integrated booster flight test to demonstrate booster capabilities. The booster design flown in the FY08 flight test is traceable to our tactical design. In addition to Kinetic Energy Interceptors execution performance, other Ballistic Missile Defense System investment priorities and threat evolution will dictate budget adjustments. At the knowledge-based decision points, the Missile Defense Agency Director will decide whether to continue the project as planned, terminate the effort, slow down the project, or accelerate the planned capabilities in pursuit of specific Test Bed or operational capability objectives.

A.2 System Element Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS)

Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Early threat engagement in the boost/ascent regime is where target intercepts and observations from the kill vehicle offer the greatest defensive payoff. We are adding a boost/ascent layer and mobile midcourse capabilities to earlier Blocks to pace the threat and increase Ballistic Missile Defense System robustness. The Kinetic Energy Interceptors system will have the capability to counter medium-range, intermediate-range, and intercontinental ballistic missiles in all phases of flight outside the atmosphere.

The Kinetic Energy Interceptors program provides a high confidence path to an initial boost phase defense layer and complements the unique operational capabilities of the revolutionary directed energy Airborne Laser. A boost phase intercept negates the threat prior to payload and countermeasure release. The presence of a forward boost layer dramatically complicates the effort of any aggressor to threaten or attack the United States or its friends and allies with ballistic missiles. The Agency is maintaining parallel development paths through FY08 with Airborne Laser and Kinetic Energy Interceptors to ensure delivery of the critical boost layer by Block 2014. The additional Kinetic Energy Interceptor capability to intercept in the early ascent phase, enabling single forward-based sites to deny and defend extremely large regions. The early ascent phase fills coverage gaps that may arise due to geopolitical basing limitations, threat advancements, or adversary launch tactics. The capability of the Kinetic Energy Interceptor to intercept in the early ascent phase also enhances forward-based sensor effectiveness by constraining threat response (launch area and timing) options while also providing forward sensor protection.

The Agency's Responsible Engineering organization requires new payload and sensor capabilities to defeat emerging or future threats in midcourse. The Kinetic Energy Interceptor common booster is designed to carry the multiple kill vehicle and discrimination augmentation payloads needed to counter complex threats in midcourse. The Kinetic Energy Interceptor's mobility, fast acceleration, and heavy lift capacity enable the ability to

deliver these payloads early in the midcourse timeline. The early Kinetic Energy Interceptors shots, in combination with later Ground Based Interceptor or Aegis Ballistic Missile Defense shots, increase the protection level and robustness of the Ballistic Missile Defense System.

The intelligence communities' ability to predict exactly what the ballistic missile threat will be ten years from now is limited. The mobile Kinetic Energy Interceptor offers the warfighter and our Allies a responsive weapon capability to counter the rapid emergence of new adversaries, countermeasures, and tactics. When based in the United States or Allied country, the Kinetic Energy Interceptors battery can provide wide-area asymmetric defense coverage against any threat that flies in the exoatmosphere (short-to-long range ballistic missiles). In a forward-based role, the warfighter can employ the Kinetic Energy Interceptor to cut off vulnerable attack corridors designed to exploit fixed site defenses. The strategic basing flexibility of the Kinetic Energy Interceptor is enhanced by its ability to engage targets with only space-based sensor support.

The Kinetic Energy Interceptors ability to execute this suite of gap-filling missions is enabled by a flexible fire control design that allows the interceptor to receive and react to fused data from a diverse suite of ballistic missile defense sensors (land, sea, and space). This data is integrated with the Kinetic Energy Interceptors element via Ballistic Missile Defense System Command and Control, Battle Management and Communications. Prior to Block 2014, Kinetic Energy Interceptor developed early threat typing, rapid state vector generation, and threat trajectory prediction capabilities will be integrated into Ballistic Missile Defense System Command and Control, Battle Management and Communications Test Beds to enhance overall Ballistic Missile Defense System performance.

A top acquisition priority of the Kinetic Energy Interceptors is to improve interceptor quality and mission assurance, lower producibility risk, and reduce costs. The Kinetic Energy Interceptors contractor team is designing in product quality, affordability, core standards, and mission assurance at the outset of the program where the systems engineering investment yields the most leverage. Early program focus on manufacturing design and affordability will allow us to purchase high performance, multi-use, mobile interceptors at lower cost.

A.3 Major System Element Goals

Kinetic Energy Interceptors Development and Test:

- Successfully complete knowledge point development and test events in support of FY08 decision point
  - Verify battle management and fire control capabilities (timelines and engagement sequences) through multiple real-time battle management and fire control tests with fully integrated Ballistic Missile Defense System sensor and Command, Control, Battle Management, and Communications capabilities
  - Conduct a series of wind tunnel and booster (first and second stage) static firing test events
  - Conduct an integrated booster flight test by 4th quarter FY08 with a booster design that is traceable to the tactical design

- Design the Block 2014 multi-use interceptor and fire control capabilities in close collaboration with the Agency Systems Engineering team
- Demonstrate mobile intercept capabilities in flight test by Block 2012 and complete multi-use (boost, ascent, midcourse) intercept test series by Block 2014

A.4 Major Events Schedule and Description

Major Event	Project	Timeframe	Description
Flight Test			
Kinetic Energy Interceptors Knowledge Point Events			
Booster flight test #1	R213	4Q FY 2008	
Booster flight test #2	R213	3Q FY 2010	
Ground Test			
Integration and Test			
Conduct Element Ground Test	R213	3Q FY 2010	
Conduct Integrated Ground Test	R213	4Q FY 2011	
Kinetic Energy Interceptors Knowledge Point Events			
Kill vehicle integrated ground test	R213	4Q FY 2011	
Other			
Element Engineering			
Generate final ECS and A-Spec	R213	3Q FY 2007	
Complete multi-use performance assessment #3	R213	4Q FY 2007	
Conduct element SDR	R213	4Q FY 2007	
Conduct design review - 0	R213	3Q FY 2009	
Conduct design review - 1	R213	1Q FY 2011	
Government System Engineering & Program Management			
Sea Mobile Alternatives Assessment Phase-0	R113	4Q FY 2005	
Sea Mobile Alternatives Assessment	R213	1Q FY 2006 - 3Q FY 2007	
Support Boost/Ascent Reports to Congress	R213	2Q FY 2006 - 4Q FY 2006	
Complete transition of KI office to Huntsville, AL	R213	4Q FY 2006	
Kinetic Energy Interceptors Knowledge Point Events			
Conduct DSP Direct Downlink Fire Control Tests	R113	3Q FY 2005	• In Pathfinder Shelter
Stage 2 proof of concept static fire	R213	2Q FY 2006	
Complete booster wind tunnel tests	R213	3Q FY 2006	
Conduct fused ONIR-Radar fire control tests	R213	3Q FY 2006	• In Pathfinder shelter (multiple engagement sequences)
Stage 1 proof of concept static fire	R213	4Q FY 2006	
Conduct fused ONIR-Radar fire control tests	R213	3Q FY 2007	• With deployed KEI shelter (multiple engagement sequences)
Stage 2 development motor static fire	R213	3Q FY 2007	

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Major Event	Project	Timeframe	Description
Stage 1 development motor static fire	R213	4Q FY 2007	
Stage 1 development motor static fire	R213	1Q FY 2008 - 2Q FY 2008	
Stage 2 development motor static fire	R213	1Q FY 2008 - 2Q FY 2008	
Conduct fused ONIR-Radar - STSS fire control tests	R213	3Q FY 2008	• With deployed KEI shelter (multiple engagement sequences)
Stage 1 design update static fire test	R213	3Q FY 2009	
Stage 2 design update static fire test	R213	3Q FY 2009	

B. Program Change Summary	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2006 PB)	279,815	229,658	444,900
Current President's Budget (FY 2007 PB)	272,064	209,342	405,508
Total Adjustments	-7,751	-20,316	-39,392
Congressional Specific Program Adjustments	0	-13,706	0
Congressional Undistributed Adjustments	0	-6,610	0
Reprogrammings	-3,133	0	0
SBIR/STTR Transfer	-4,618	0	0
Adjustments to Budget Years	0	0	-39,392

FY05 reduction of $7.751 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $20.316 million includes the Congressionally directed transfer of the Near Field Infrared Experiment (NFIRE) the BMD Technology Program Element (PE #0603175C) and a portion of the MDA Congressional undistributed adjustment.

FY07 Reduction of $39.392 million follows through with the Congressionally directed transfer of the NFIRE to the BMD Technology PE #0603175C and includes overhead/infrastructure reductions.

The Kinetic Energy Interceptors Development and Test program was restructured prior to the FY06 President's budget submission to include only the essential development and test efforts required to support the FY08 knowledge-based decision point. For FY07, the overall program plan and objectives remain the same; however, we have subsequently conducted detailed planning of our near term risk reduction activities through FY08. As a result, we removed the early two-color seeker risk reduction work from the Kinetic Energy Interceptors program. Aegis Ballistic Missile Defense now has the lead for MDA. These changes keep the scope of our risk reduction activities within available funding. The second stage rocket motor

static fire moved into FY06 (from 4th quarter FY05) to allow a detailed investigation of an observed bonding separation between the propellant and liner in one area of the motor. In the FY06 President's Budget exhibits, we indicated that we expected the delivery of kinetic, multi-use intercept capabilities in Block 2012/2014. We now expect to begin intercept flight testing in Block 2012 with a planned completion of ten intercept tests by Block 2014.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
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COST ($ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R113 Ballistic Missile Defense Interceptor Block 2012	256,809	0	0	0	0	0	0
RDT&E Articles Qty	3	0	0	0	0	0	0

Note: RDT&E Articles: Development Verification Test Pathfinder Shelter (1); Near Fire Infrared Experiment targets (2)

A. Mission Description and Budget Item Justification

The Kinetic Energy Interceptors program is developing and testing mobile interceptor and fire control capabilities for the Agency's next generation, multi-use (boost, ascent, and midcourse) kinetic intercept capabilities. The land-mobile Kinetic Energy Interceptor Element consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. A single interceptor design is compatible with both land and sea-mobile basing, and the booster is designed to accommodate multiple payload types (single or multiple kill vehicles). The Kinetic Energy Interceptor relies on distributed external sensors and flexible communication capabilities to deliver responsive layered defensive capabilities to the Ballistic Missile Defense System. The program execution focus through FY08 is the completion of booster and fire control knowledge point events that conclusively demonstrate the programs' readiness to proceed to intercept flight testing and Ballistic Defense System Test Bed integration. The knowledge point testing includes ten rocket motor static fires, a wind tunnel test series, an integrated tactical booster flight test in FY08, and a campaign of real-time battle management and fire control tests with integrated Ballistic Missile Defense System sensors, and Command, Control, Battle Management, and Communication capabilities. The knowledge-point development and testing, along with parallel objective element design, is enabled by a disciplined systems engineering effort across all the integrated product teams. We plan to transition to intercept flight testing in Block 2012 if the FY08 knowledge point events are successful. The MDA Director will determine the initial flight test mission emphasis (boost or ascent/midcourse) of the Kinetic Energy Interceptor program after the FY08 decision point based on threat evolution and the performance of other Ballistic Missile Defense System elements such as the Airborne Laser.

The Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Kinetic Energy Interceptors unique mobility and performance combination enables early threat engagements in the boost/ascent regime where target intercepts and sensor observations offer the greatest defensive payoff. By adding a kinetic boost layer and flexible ascent/midcourse capabilities to earlier Block deployments, we are able to pace the threat, fill performance gaps, and increase Ballistic Missile Defense System robustness.

The Kinetic Energy Interceptors development and test effort is comprised of element engineering, interceptor, fire control and communications, launcher, integration and test, government system engineering and program management, and government system integration and test work packages.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
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B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Element Engineering	28,275	0	0
RDT&E Articles (Quantity)	0	0	0

The Kinetic Energy Interceptors element engineering activities include all prime contractor program management operations, capability and interface specification development and flow-down, operations concept definition, element-level design trades, engagement sequence definition, element analyses and performance assessments, configuration control and change management, manufacturing, quality, affordability and risk-reduction, simulation development, and collaborative engineering planning and management with the Kinetic Energy Interceptor integrated product teams and key Agency organizations (Systems Engineering, Sensors, and Command, Control, Battle Management and Communications).

FY05 Accomplishments:

- Updated concept design baseline to incorporate Agency core standard requirements (e.g., nuclear hardening, insensitive munitions), anti-tamper technology protection, a 2-color seeker, and expanded signal processing capacity
- Updated element capability and interface specifications
- Completed element boost/ascent phase performance assessment #1
- Generated FY08 knowledge point test objectives and product development requirements

	FY 2005	FY 2006	FY 2007
Interceptor	113,969	0	0
RDT&E Articles (Quantity)	0	0	0

The interceptor component development and test activities include requirements definition, design, fabrication, and test of multi-use interceptor capabilities. The near term interceptor development focus is on executing a series of wind tunnel tests and static fires leading to a tactically representative booster flight test in FY08.

FY05 Accomplishments:

- Developed boost flight test objectives, requirements, and interface specifications
- Defined baseline booster configuration for the FY08 booster flight test
- Executed initial booster flight wind tunnel tests series to validate critical stability and control requirements
- Performed 1st and 2nd stage propellant characterization tests
- Designed, manufactured, assembled and loaded the Stage 2 Proof of Concept static fire rocket motor

- Conducted nozzle characterization tests to characterize the performance of the Stage 2 Proof of Concept trapped ball nozzle and the thrust vector control actuators

	FY 2005	FY 2006	FY 2007
Fire Control and Communications	19,828	0	0
RDT&E Articles (Quantity)	1	0	0

The fire control and communications component development and test activities include requirements definition, design, fabrication, and verification/validation of the Block 2014 capability. This effort also includes execution of near-term activities to reduce risk associated with Ballistic Missile Defense System interface definition, fire control algorithm performance and robustness, internal and external latencies, and false alarm rate. Risk reduction work includes building a prototype shelter and testing data fusion and decision software with live overhead and radar sensor data.

FY05 Accomplishments:
RDT&E Articles: Development Verification Test Pathfinder Shelter (1)

- Built a fire control Pathfinder shelter with direct downlink capability and real-time tracking and fire control software to validate and verify Kinetic Energy Interceptor engagement sequences and timelines against global targets of opportunity
- Demonstrated through live and playback test events the ability to generate boost phase intercept fire control solutions with direct downlink of overhead sensor data
- Defined and demonstrated Kinetic Energy Interceptor to Ballistic Missile Defense System interfaces by passing messages in series of ground-based demonstration experiments
- Completed design of the X-band radar sensor interface to the Pathfinder shelter
- Completed In-Flight Communications System waveform study and antenna breadboard design for anti-jamming and operations in a nuclear environment

	FY 2005	FY 2006	FY 2007
Launcher	11,540	0	0
RDT&E Articles (Quantity)	0	0	0

The near term land-mobile launcher development and test activities are limited to concept design, requirements definition, and interface definition in support of a System Design Review in FY07. In FY05, the launcher activity included both the launcher and interceptor canister. Canister development in FY06 and is now part of the interceptor development and test work package.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

FY05 Accomplishments:

- Developed a draft all-up-round requirements specification that established critical functional requirements and interfaces for the integrated canister and interceptor
- Conducted a launcher Concept Design Review that documented baseline launcher and canister capability and established requirements for mechanical and electrical interfaces from the canister to the interceptor
- Developed a draft launcher to all-up-round interface control document that established critical functional interfaces and communication message definitions

	FY 2005	FY 2006	FY 2007
Integration and Test	2,244	0	0
RDT&E Articles (Quantity)	0	0	0

The Kinetic Energy Interceptor integration and test activities include development master test planning, coordination of test range interfaces, participation in ballistic missile defense war games, integration event and facility planning, and target requirement definition in collaboration with the Agency Systems Engineering team.

FY05 Accomplishments:

- Drafted Developmental Master Test Plan
- Continued range resource and safety planning and coordination for the FY08 booster flight
- Assessed potential sites for the System Integration Facility and Element Integration Facility
- Selected site for the System Integration Laboratory (Huntsville, Alabama) to become operational in FY09
- Participated in Nimble Titan Wargame
- Drafted target requirements document

	FY 2005	FY 2006	FY 2007
Government Systems Engineering and Program Management	14,703	0	0
RDT&E Articles (Quantity)	0	0	0

The Government Systems Engineering and Program Management effort includes the program office, service laboratory and intelligence agency generation of threat data packages for the Kinetic Energy Interceptors development and test contract, Ballistic Missile Defense System interface definition and implementation support outside the Kinetic Energy Interceptor program office, off-contract technology risk reduction efforts, and off-contract special studies such as congressional reports and the sea-based alternatives assessment.

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The Kinetic Energy Interceptor is designed as a common land/sea all-up round. The interceptor dimensions and safety features such as a gas eject launch make it compatible with surface combatants, submarines, and large non-combatant ships. In FY05 we completed a joint study with the Navy on the concept of operations and feasibility of sea-mobile multi-use missions. In FY06 and FY07 we will continue our joint efforts to conduct a comprehensive alternatives assessment of viable sea-mobile platforms. The study group will recommend a platform strategy allowing us to begin platform-specific planning, system engineering, and risk reduction to facilitate a smooth start on future sea-mobile development and test after the FY08 decision point.

FY05 Accomplishments:

- Continued program office operations
- Delivered a Report to Congress on Kinetic Energy land- and sea-mobile capabilities
- Delivered boost and ascent threat data packages to prime contractor
- Completed a joint Kinetic Energy Interceptors Midcourse Concept of Operations Study with the Navy
- Completed Phase 0 of the sea-based alternatives assessment study with the Navy
- Completed concept design of a variable controlled thrust solid divert and attitude control system, an alternate path to our liquid divert and attitude control system baseline

	FY 2005	FY 2006	FY 2007
Government Systems Integration & Test	550	0	0
RDT&E Articles (Quantity)	0	0	0

The Government Systems Integration and Test effort includes the Kinetic Energy Interceptors lethality project and target of opportunity data collection and analysis to reduce key program risks such as plume-to-hardbody handover and early ascent phase discrimination. The Kinetic Energy Interceptors lethality strategy extensively leverages previous work by other Ballistic Missile Defense System elements. The lethality project includes computer simulation of various boost/ascent and midcourse engagements between the Kinetic Energy Interceptors kill vehicle and threat missiles. The simulation results will ultimately be corroborated by collecting engagement data from Kinetic Energy Interceptors flight tests. A key aspect of our lethality approach is early involvement by the Director, Operational Test and Evaluation in our strategy development and execution.

FY05 Accomplishments:

- Conducted lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and one of four long range threat missiles

- Developed requirements for an instrumented threat representative target to be used during Kinetic Energy Interceptors flight tests to corroborate simulation results

	FY 2005	FY 2006	FY 2007
NFIRE	65,700	0	0
RDT&E Articles (Quantity)	2	0	0

Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C). Years affected are FY06 ($13,706) and FY07 ($10,800).

FY05 Accomplishments:
RDT&E Articles: 2 targets

- Completed calibration of the tracking sensor payload to establish the sensor baseline performance
- Initiated spacecraft bus assembly, integration, and test to prepare for integrating the sensor on the spacecraft
- Initiated ground segment development and testing to establish the space and ground communications network for training and operations
- Initiated experiment planning to define the specific events, resources, and coordination required for data collections
- Initiated development of target vehicles to support Near Field Infrared Experiment fly-by missions
- Refurbished ground equipment/test equipment for fly-by target vehicles at range and contractor facility

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

C. Other Program Funding Summary

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603884C Ballistic Missile Defense Sensors	567,193	294,283	536,428	554,012	623,089	306,965	217,590	3,099,560
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

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D. Acquisition Strategy

The Kinetic Energy Interceptors acquisition strategy focuses on developing gap-filling, multi-use kinetic energy capabilities for strategically deployable land-mobile and sea-mobile platforms. A feature distinguishing this acquisition strategy is our early emphasis on full scale risk mitigation testing and engineering, manufacturing, and software readiness as an integral part of the design process. Our contractor team will design, build and test operationally traceable interceptor and fire control capabilities in realistic test environments prior to Design Review-0 in FY09. The FY05-FY08 development verification test results mitigate critical program risks, and provide the agency very detailed design, performance, cost, and programmatic knowledge to support the FY08 knowledge point decision. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these up front program investments in systems engineering, full scale risk reduction testing, and manufacturing process development is reduced redesign and retest, fewer test failures as well as lowered manufacturing cost. The strategy has event-based knowledge points using Engineering and Manufacturing Readiness Levels and Software Readiness Levels as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. In response to budget reductions, we will maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 2012 to Block 2014.

To implement the development and test strategy we competitively picked a single contractor team who offered the best balance of mission assurance confidence, technological maturity, mission capability (system performance), managerial and technical team performance and price. That contractor also offered us a competitive price commitment for the hardware we will buy as well as a firm fixed price, 10 year warranty covering virtually any reliability failure or performance shortfall relative to the performance specification. The early commitment to a production price and warranty conditions are integral to our strategy. These give the contractor a huge monetary incentive to promise only what he is certain he can deliver, to design in features that enhance reliability and lower production cost and to have a robust ground test program to uncover any systemic issues before flight test.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Engineering								
Contractor Element Engineering	C/CPAF	Northrop Grumman, Arlington, VA	28,275	0	N/A	0	N/A	28,275
Interceptor								
Interceptor	C/CPAF	Raytheon, Tuscon, AZ	112,769	0	N/A	0	N/A	112,769
TDACS	C/CPAF	SMDC, Huntsville, AL	1,200	0	N/A	0	N/A	1,200
Fire Control and Communications								
Fire Control and Communications	C/CPAF	Northrop Grumman, Huntsville, AL/Boulder, CO	18,312	0	N/A	0	N/A	18,312
GFE	C/CPAF	Northrop Grumman, Arlington, VA	61	0	N/A	0	N/A	61
C2BMC	C/CPAF	Missle Defense Agency/BC, Washington, DC	1,455	0	N/A	0	N/A	1,455
Launcher								
Launcher	C/CPAF	Northrop Grumman, Sunnyvale, CA	11,540	0	N/A	0	N/A	11,540
Integration and Test								
Integration & Test	C/CPAF	Northrop Grumman, El Segundo, CA	2,244	0	N/A	0	N/A	2,244
NFIRE								

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Spacecraft	C/CPAF	General Dynamics, Gilbert, AZ	17,380	0	N/A	0	N/A	17,380
Tracking Payload	C/CPAF	AFRL, Kirtland AFB, NM	6,101	0	N/A	0	N/A	6,101
Launch Vehicle	CPAF	SMC Det 12, Orbital, Chandler, AZ	9,947	0	N/A	0	N/A	9,947
Targets	C/CPAF	MDA/TC/KAFB, Albuquerque, NM/OSC, Chandler, AZ	18,487	0	N/A	0	N/A	18,487
Secure Communications	MIPR	Com Sec Gear, San Antonio, TX	500	0	N/A	0	N/A	500
Science Team	MIPR	Aerospace, El Segundo, CA	1,315	0	N/A	0	N/A	1,315
Mission Operations	C/CPAF	JNIC, Colorado Springs, CO	5,530	0	N/A	0	N/A	5,530
Calibration & Analysis	MIPR	AEDC, Arnold AFB, TN	983	0	N/A	0	N/A	983
Calibration & Analysis	C/CPAF	Space Dynamics Lab, North Logan, UT	1,669	0	N/A	0	N/A	1,669
Science Team	MIPR	MIT/LL, Hanscom AFB, MA	2,770	0	N/A	0	N/A	2,770
Tracking Payload	C/CPFF	MEI, Arlington, VA	1,018	0	N/A	0	N/A	1,018
Subtotal Product Development			241,556	0		0		241556

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Systems Engineering and Program Management								
Engineering Technical Support	MIPR	NSWC/DD, Dahlgren, VA	305	0	N/A	0	N/A	305
Civilian Salaries		Missile Defense Agency, Washington, DC	615	0	N/A	0	N/A	615
Government Travel		Missile Defense Agency, Washington, DC	41	0	N/A	0	N/A	41
SETA	C/FFP	MEI, Arlington, VA	5,676	0	N/A	0	N/A	5,676
SETA	C/FFP	Sparta, Rosslyn, VA	275	0	N/A	0	N/A	275
Strategic Studies	C/FFP	Center for Strategic Studies, Washington, DC	46	0	N/A	0	N/A	46
VV&A Training	MIPR	NAVAIR, China Lake, CA	20	0	N/A	0	N/A	20
Security Specialist	C/FFP	BETA, Maryland, VA	151	0	N/A	0	N/A	151
EMC Support	MIPR	Joint Spectrum Center, Annapolis, MD	195	0	N/A	0	N/A	195
Sea Mobile POAM	C/FFP	Booz-Allen, McLean, VA	76	0	N/A	0	N/A	76
KEI BMDS Interfaces	C/CPAF	SMDC, Huntsville, AL	2,425	0	N/A	0	N/A	2,425
KEI BMDS Interfaces	MIPR	NSWC/DD, Dahlgren, VA	300	0	N/A	0	N/A	300

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
KEI BMDS Interfaces	C/FFP	Sparta, Rosslyn, VA	75	0	N/A	0	N/A	75
Sea Mobile Platform AA	MIPR	NSWC/DD, Dahlgren, VA	592	0	N/A	0	N/A	592
Sea Mobile Platform AA	MIPR	Naval Research, Arlington, VA	37	0	N/A	0	N/A	37
KEI Technical Support	MIPR	Army Research, Redstone Arsenal, AL	250	0	N/A	0	N/A	250
Adversary Capability High Fidelity	C/CPAF	AFRL, Kirtland AFB, NM	2,140	0	N/A	0	N/A	2,140
BMDS Sensor Data Generation	C/CPAF	AFRL, Kirtland AFB, NM	100	0	N/A	0	N/A	100
FBX-T Interface Development	C/FFP	Raytheon	500	0	N/A	0	N/A	500
ONIR Sensor Model Validation	MIPR	Surface Warfare Center, Schriever AFB, CO	500	0	N/A	0	N/A	500
Conus KEI	C/CPAF	JNIC, Colorado Springs, CO	115	0	N/A	0	N/A	115
Sea Mobile Platform AA	C/FFP	JHU/APL, Baltimore, MD	60	0	N/A	0	N/A	60
STSS Special Study	MIPR	SMC/ISPB, El Segundo, CA	100	0	N/A	0	N/A	100
KEI Support	C/FFP	JHU/APL, Baltimore, MD	9	0	N/A	0	N/A	9
KEI BMDS Interfaces	MIPR	SMDC, Huntsville, AL	100	0	N/A	0	N/A	100
Subtotal Support Costs			14,703	0		0		14703

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Systems Integration & Test								
Lethality	MIPR	Sandia National Lab, Abuquerque, NM	550	0	N/A	0	N/A	550
TOOs	MIPR	VAFB, Santa Barbara, CA	0	0	N/A	0	N/A	
Subtotal Test and Evaluation			550	0		0		550

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services								

Remarks

Project Total Cost			256,809	0		0		256,809

Remarks

The Prime Contractor has the responsibility to balance resources across the KEI program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Kinetic Energy Interceptors Knowledge Point Events																												
Conduct DSP Direct Downlink Fire Control Tests			▲																									
Element Engineering																												
Concept design baseline update			▲																									
Generate booster and fire control DVT requirements			▲																									
Complete boost/ascent performance assessment #1				▲																								
Fire Control and Communications																												
Build pathfinder shelter			▲																									
Conducted Direct Downlink Experiment			▲																									
Government System Engineering & Program Management																												
Sea Mobile Alternatives Assessment Phase-0				▲																								
Near Field Infrared Experiment																												
Complete calibration of tracking sensor payload		▲																										

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▬▲	Complete Activity	△▬△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Kinetic Energy Interceptors Knowledge Point Events							
Conduct DSP Direct Downlink Fire Control Tests	3Q						
Element Engineering							
Concept design baseline update	3Q						
Deliver KEI SIM Version 1.1	3Q						
Generate booster and fire control DVT requirements	3Q						
Update element capability interface specifications	3Q						
Complete boost/ascent performance assessment #1	4Q						
Interceptor							
1st and 2nd stage propellant tests	2Q						
Booster Wind Tunnel Tests	3Q						
Fire Control and Communications							
Build pathfinder shelter	3Q						
Conducted Direct Downlink Experiment	3Q						
Demonstrated data fusion in lab	3Q						
Launcher							
Conduct Initial Requirements Review	2Q						
Integration and Test							
Assessed Potential Sites for Facility Mods	2Q-4Q						
Publish/Update Development Master Test Plan	3Q						
Publish/Update Target Requirements Documentation	3Q						
Participate in Nimble Titan Wargame	4Q						
Government System Engineering & Program Management							
Deliver Report to Congress on KEI Basing	2Q						
Deliver Boost/Ascent threat data packages	3Q						
Complete Navy Concept of Operations Study	4Q						
Sea Mobile Alternatives Assessment Phase-0	4Q						
TDACS concept design	4Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Near Field Infrared Experiment							
Experiment planning	1Q-4Q						
Ground segment development and testing	1Q-4Q						
Spacecraft bus assembly, integration, and test	1Q-4Q						
Complete calibration of tracking sensor payload	2Q						
Government Integration and Test							
Lethality sims boost/ascent long-range targets	4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

COST ($ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R213 Ballistic Missile Defense Interceptor Block 2014	0	201,933	386,300	400,000	851,900	1,149,000	1,651,018
RDT&E Articles Qty	0	1	0	0	4	5	11

Note: Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C).

The Agency transitioned the Space Test Bed Program (Project R216) to the Ballistic Missile Defense System Space Program (Project 0517, PE 0603895C).

RDT&E Articles: FY06 - Booster Flight 1 - First and Second stage motors with moc payload (1). FY09 - Booster Flight 2 - First and Second stage motors with moc payload (1); Partial full scale - Interceptor flight with moc payload (1); Engineering Model Launcher (1); Prototype with Version 1 software - used for controlled test vehicle flight (1). FY10 - Controlled Test Vehicle - first flight with active Kill Vehicle (inert Liquid Divert and Attitude Control System (1); Element Charactrization Flight - First Interceptor flight against target (1); Spare Interceptor (1); Operational Model Launcher 1 - Used for Element Characterization Flight (1); Operational Model Launcher 2 - Used for Environmental and Mobility testing (1). FY11 - Ship risk Reduction Flight - Interceptor flight against target from ship platform (1); Integrated Flight Test 1 (1); Integrated Flight Test 2 (1); Integrated Flight Test 3 - First Production Interceptor (1); Operational Model Launcher 3 - Used for controlled test vehicle and ship risk reduction flights, spare for IT1 (1); Engineering Unit 1 with Version 2 software used for Element Characterization Flight (1); Engineering Unit 2 with Version 2 software used for ship risk reduction flight (1); Solid target for Element Characterization Flight (1); Spare solid target (1); Solid target for ship risk reduction flight (1); Liquid two-stage target for integrated flight test 1 (1)

A. Mission Description and Budget Item Justification

The Kinetic Energy Interceptors program is developing and testing mobile interceptor and fire control capabilities for the Agency's next generation, multi-use (boost, ascent, and midcourse) kinetic intercept capabilities. The land-mobile Kinetic Energy Interceptor Element consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. A single interceptor design is compatible with both land and sea-mobile basing, and the booster is designed to accommodate multiple payload types (single or multiple kill vehicles). The Kinetic Energy Interceptor relies on distributed external sensors and flexible communication capabilities to deliver responsive layered defensive capabilities to the Ballistic Missile Defense System. The program execution focus through FY08 is the completion of booster and fire control knowledge point events that conclusively demonstrate the programs' readiness to proceed to intercept flight testing and Ballistic Defense System Test Bed integration. The knowledge-point testing includes ten rocket motor static fires, a wind tunnel test series, an integrated tactical

booster flight test in FY08, and a campaign of real-time battle management and fire control tests with integrated Ballistic Missile Defense System sensors, and Command, Control, Battle Management, and Communication capabilities. The knowledge point development and testing, along with parallel objective element design, is enabled by a disciplined systems engineering effort across all the integrated product teams. We plan to transition to intercept flight testing in Block 2012 if the FY08 knowledge point events are successful. The MDA Director will determine the initial flight test mission emphasis (boost or ascent/midcourse) of the Kinetic Energy Interceptor program after the FY08 decision point based on threat evolution and the performance of other Ballistic Missile Defense System elements such as the Airborne Laser.

The Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Kinetic Energy Interceptors unique mobility and performance combination enables early threat engagements in the boost/ascent regime where target intercepts and sensor observations offer the greatest defensive payoff. By adding a kinetic boost layer and flexible ascent/midcourse capabilities to earlier Block deployments, we are able to pace the threat, fill performance gaps, and increase Ballistic Missile Defense System robustness.

The Kinetic Energy Interceptors development and test effort is comprised of element engineering, interceptor, fire control and communications, launcher, integration and test, government system engineering and program management, and government system integration and test work packages.

B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Element Engineering	0	40,908	68,352
RDT&E Articles (Quantity)	0	0	0

The Kinetic Energy Interceptors element engineering activities include all prime contractor program management operations, capability and interface specification development and flow-down, operations concept definition, element-level design trades, engagement sequence definition, element analyses and performance assessments, configuration control and change management, manufacturing, quality, affordability and risk-reduction, simulation development, and collaborative engineering planning and management with the Kinetic Energy Interceptor integrated product teams and key Agency organizations (Systems Engineering, Sensors, and Command, Control, Battle Management and Communications).

FY06 Planned Program:

- Continue prime contractor program management operations
- Conduct concept baseline update review to capture multi-use (boost, ascent, midcourse) design updates
- Update element capability and interface specifications
- Generate draft A-spec and flow-down to component integrated product teams

- Complete boost/ascent/midcourse performance assessment #2
- Deliver Kinetic Energy Interceptors Simulation (KEISIM) version 2.0

FY07 Planned Program:
- Continue prime contractor program management operations
- Conduct System Design Review
- Complete Kinetic Energy Interceptors Test Bed Description Document, system specification, and element capability and interface specifications
- Generate final element A-spec and flow down to component integrated product teams
- Complete boost/ascent/midcourse performance assessment #3
- Deliver Kinetic Energy Interceptors Simulation (KEISIM) version 3.0

	FY 2005	FY 2006	FY 2007
Interceptor	0	106,138	220,390
RDT&E Articles (Quantity)	0	1	0

The FY07 interceptor component development and test activities build on FY06 Stage 1 and 2 Proof of Concept static motor firings and focus on the essential efforts required to fly a tactically representative booster in FY08. These activities include extensive ground testing and integration of key components (rocket motors, thrust vector control units, avionics and software, etc.) necessary to demonstrate the booster capability with a high probability of mission success. Upon successful completion of the booster flight knowledge/decision point, we will directly leverage the booster flight design and knowledge gained to engineer a robust Block 2014 multi-use interceptor that is both producible and reliable. We will demonstrate this capability through an increasingly complex set of ground and flight tests ranging from static motor firings to fully integrated intercept tests.

FY06 Planned Program:
RDT&E Articles: Booster Flight 1 - First and Second stage motors with moc payload (1)

- Conduct the Stage 2 Proof of Concept rocket motor static firing
- Complete booster hypersonic wind tunnel test series
- Conduct booster flight test Preliminary Design Review
- Proof test an inert Stage 1 motor case to validate the pressure capability of the composite case and demonstrate the production, propellant loading and processing of the Stage 1 motor

- Conduct the Stage 1 Proof of Concept rocket motor static firing
- Initiate procurement of long-lead hardware for FY08 booster flight test

FY07 Planned Program:
- Conduct booster flight test Critical Design Review to define the final configuration for FY08 boost flight
- Conduct Stage 1 and 2 rocket motor static firings to subject the motors to increasingly severe environmental and load testing
- Perform ground testing of the boost flight avionics and associated software
- Execute ground testing of the Stage 1 to Stage 2 stage separation hardware
- Burst test a Stage 2 rocket motor case to determine the ultimate pressure capability of the booster flight motor configuration
- Conduct bench testing of thrust vector control actuators
- Conduct interceptor component System Design Review for Block 2014 multi-use capability
- Begin fabrication and test of booster flight hardware

	FY 2005	FY 2006	FY 2007
Fire Control and Communications	0	23,798	36,938
RDT&E Articles (Quantity)	0	0	0

The fire control and communications component development and test activities include requirements definition, design, fabrication, and verification/validation of the Block 2014 objective capability. This effort also includes execution of near-term activities to reduce risk associated with Ballistic Missile Defense System interface definition, fire control algorithm performance and robustness, internal and external communication latencies, and false alarm rate. Risk reduction work includes building a prototype Kinetic Energy Interceptor Fire Control shelter and testing data fusion and decision software with live overhead infrared and radar sensor data.

FY06 Planned Program:
- Demonstrate forward-based radar interface and fusion of radar and infrared data in the Pathfinder shelter (playback and live fire control test events)
- Demonstrate our ability to receive and process national sensor data in the field to support formation of accurate missile tracks in the boost phase
- Complete in-flight data link compatibility analysis with the Navy Cooperative Engagement Capability System to ensure non-interference operations on land and sea
- Build antenna panels to characterize in-flight communications system performance

- Update interface requirements to the Ballistic Missile Defense System Command and Control, Battle Management and Communications element

FY07 Planned Program:
- Conduct fire control and communication component System Design Review
- Continue to demonstrate multi-use (boost, ascent, and midcourse) Kinetic Energy Interceptor engagement sequences in the field with mobile Pathfinder shelter (overhead non-imaging infrared and forward-based radar sensors)
- Establish an integration lab to check out and test our fire control and communications subcomponents in a controlled environment
- Initiate compatibility testing with prototype transmit panel to demonstrate compatibility with Navy Cooperative Engagement Capability system
- Test in-flight communications system transmit panel in lab to validate transmitter design
- Initiate procurement of hardware and software for the System Integration Lab and System Integration Facility

	FY 2005	FY 2006	FY 2007
Launcher	0	7,377	14,001
RDT&E Articles (Quantity)	0	0	0

The near term land-mobile launcher development and test activities include requirements definition, launcher design, and interface definition in support of a Kinetic Energy Interceptor System Design Review in FY07.

FY06 Planned Program:
- Conduct land-mobile launcher concept design trades
- Develop draft launcher prime item development specification to establish the baseline performance requirements for the launcher hardware and software
- Define launcher interfaces between the launcher component, fire control and communications component, and all-up-round to assure interoperability
- Provide launcher input to support element operational concept development

FY07 Planned Program:
- Complete launcher concept design trades and functional requirements analyses
- Complete launcher prime item development specification
- Conduct launcher System Design Review to finalize the launcher functional baseline and capability definition

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
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- Establish launcher interface requirements to other Kinetic Energy Interceptors components (all-up round and fire control)

	FY 2005	FY 2006	FY 2007
Integration and Test	0	4,760	27,052
RDT&E Articles (Quantity)	0	0	0

The Kinetic Energy Interceptor integration and test responsibilities include development master test planning, coordination of test range interfaces, participation in ballistic missile defense war games, integration facility planning and design, integration facility construction, environmental analyses and documentation, manufacturability planning, and target requirements definition in collaboration with the Agency Systems Engineering team.

FY06 Planned Program:

- Continue range resource and safety planning and coordination for FY08 booster flight
- Select site for System Integration Facility and Element Integration Facility and initiate environmental analysis
- Initiate detailed requirements analysis and design of System Integration Lab, System Integration Facility, and Element Integration Facility
- Publish target requirements documentation (liquid and solid target capabilities)
- Publish Development Master Test Plan
- Participate in Nimble Titan Wargame

FY07 Planned Program:

- Perform detailed range resource and safety planning and coordination for FY08 booster flight
- Complete detailed requirements analysis and design of System Integration Lab, System Integration Facility, and Element Integration Facility
- Initiate development and construction (architecture and engineering contracts) of System and Element Integration Facilities
- Update Development Master Test Plan and Targets Requirement Document for Element System Design Review
- Deliver lower level plans and analyses for the element System Design Review (Manufacturing Plan, Integration Plan, and Ground Support Equipment and Test Support Equipment Analyses)
- Participate in Nimble Titan Wargame
- Initiate long-lead range resource and safety and environmental planning and coordination for flight tests after FY08 knowledge point

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

	FY 2005	FY 2006	FY 2007
Government Systems Engineering and Program Management	0	18,545	17,425
RDT&E Articles (Quantity)	0	0	0

The Government Systems Engineering and Program Management effort includes the program office, service laboratory and intelligence agency generation of threat data packages for the Kinetic Energy Interceptors development and test contract, Ballistic Missile Defense System interface definition and implementation support outside the Kinetic Energy Interceptor program office, off-contract technology risk reduction efforts, and off-contract special studies such as congressional reports and the sea-based alternatives assessment.

The Kinetic Energy Interceptor is designed as a common land/sea all-up round. The interceptor dimensions and safety features such as a gas eject launch make it compatible with surface combatants, submarines, and large non-combatant ships. In FY05 we completed a joint study with the Navy on the concept of operations and feasibility of the sea-mobile multi-use mission. In FY06 and FY07 we will continue our joint efforts to conduct a comprehensive alternatives assessment of viable sea-mobile platforms. The study group will recommend a platform strategy allowing us to begin platform-specific planning, system engineering, and risk reduction to facilitate a smooth start on future sea-mobile development and test after the FY08 decision point.

FY06 Planned Program:
- Continue program office operations
- Transition program office operations from Arlington, Virginia to Huntsville, Alabama
- Continue joint Sea-Based Alternatives Assessment study with the Navy
- Update boost, ascent, and midcourse threat data package deliverables to prime contractor
- Conduct User Concept of Operation Table Top exercises to generate early warfighter feedback into development process
- Support delivery of Reports to Congress on Ballistic Missile Defense System boost and ascent phase capabilities

FY07 Planned Program:
- Continue program office operations
- Complete joint Sea-Based Alternatives Assessment study with the Navy and select a sea-mobile platform
- Complete Kinetic Energy Interceptors sections of Ballistic Missile Defense System Test Bed Description Document and System Specification in collaboration with MDA Systems Engineering team
- Update boost, ascent, and midcourse threat data package deliverables to Kinetic Energy Interceptors prime contractor

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
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	FY 2005	FY 2006	FY 2007
Government Systems Integration & Test	0	407	2,142
RDT&E Articles (Quantity)	0	0	0

The Government Systems Integration and Test effort includes the lethality project and target of opportunity data collection and analysis to reduce key program risks such as tracking and discrimination in all phases of flight. The Kinetic Energy Interceptors lethality strategy extensively leverages previous work by other Ballistic Missile Defense System elements. The lethality project includes computer simulation of various boost/ascent and midcourse engagements between the Kinetic Energy Interceptors kill vehicle and threat missiles. The simulation results will ultimately be corroborated by collecting engagement data from Kinetic Energy Interceptors flight tests. A key aspect of our lethality approach is early involvement by the Director, Operational Test and Evaluation in our strategy development and execution.

FY06 Planned Program:

- Conduct lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and the second of four long range threat missiles
- Analyze relevant Targets of Opportunity test data and incorporate results into Kinetic Energy Interceptors simulations and engineering notebooks

FY07 Planned Program:

- Conduct lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and the third of four long range threat missiles
- Begin conducting lethality simulations of midcourse engagements between the Kinetic Energy Interceptors kill vehicle and medium-to-long range threat missiles
- Employ airborne and ground sensors to collect data on dedicated Near Field Infrared Experiment Targets (3-D measurements with satellite)
- Analyze Targets of Opportunity test data and incorporate results into Kinetic Energy Interceptors simulations and engineering notebooks
- Continue planning for FY08-09 ground tests of instrumentation to be used in threat representative test target

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

C. Other Program Funding Summary

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	224,016	162,297	197,707	192,034	203,946	212,106	218,002	1,410,108
PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603884C Ballistic Missile Defense Sensors	567,193	294,283	536,428	554,012	623,089	306,965	217,590	3,099,560
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

D. Acquisition Strategy

The Kinetic Energy Interceptors development and test acquisition strategy focuses on developing gap-filling, multi-use kinetic energy capabilities for strategically deployable land-mobile and sea-mobile platforms. A feature distinguishing this acquisition strategy is our early emphasis on full scale risk mitigation testing and engineering, manufacturing, and software readiness as an integral part of the design process. Our contractor team will design, build and test operationally traceable interceptor and fire control capabilities in realistic test environments prior to Design Review-0 in FY09. The FY05-FY08 development verification test results mitigate critical program risks, and provide the agency very detailed design, performance, cost, and programmatic knowledge to support the FY08 knowledge point decision. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these up front program investments in systems engineering, full scale risk reduction testing, and manufacturing process development is reduced redesign and retest, fewer test failures as well as lowered manufacturing cost. The strategy has event-based knowledge points using Engineering and Manufacturing Readiness Levels and Software Readiness Levels as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. In response to budget reductions, we will maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 2010 to Block 2014.

To implement the development and test strategy we competitively picked a single contractor team who offered the best balance of mission assurance confidence, technological maturity, mission capability (system performance), managerial and technical team performance and price. That contractor also offered us a competitive price commitment for the hardware we will buy as well as a firm fixed price, 10 year warranty covering virtually any reliability failure or performance shortfall relative to the performance specification. The early commitment to a production price and warranty conditions are integral to our strategy. These give the contractor a huge monetary incentive to promise only what he is certain he can deliver, to design in features that enhance reliability and lower production cost and to have a robust ground test program to uncover any systemic issues before flight test.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Engineering			0	0	N/A	0	N/A	
Contractor Element Engineering	C/CPAF	Northrop Grumman, Arlington, VA	0	40,908	2Q	68,352	2Q	109,260
Interceptor			0	0	N/A	0	N/A	
Interceptor	C/CPAF	Raytheon, Tuscon, AZ	0	106,138	1Q	218,986	1Q	325,124
TDACS	C/CPAF	SMDC, Huntsville, AL	0	0	N/A	1,404	1Q	1,404
Fire Control and Communications			0	0	N/A	0	N/A	
Fire Control and Communications	C/CPAF	Northrop Grumman, Huntsville, AL/Boulder, CO	0	23,798	1Q	36,938	1Q	60,736
Launcher			0	0	N/A	0	N/A	
Launcher	C/CPAF	Northrop Grumman, Sunnyvale, CA	0	7,377	1Q	14,001	1Q	21,378
Integration and Test			0	0	N/A	0	N/A	
Integration & Test	C/CPAF	Northrop Grumman, El Segundo, CA	0	4,760	1Q	27,052	1Q	31,812
Subtotal Product Development			0	182,981		366,733		549714

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Systems Engineering and Program Management			0	0	N/A	0	N/A	
Civilian Salaries		Missile Defense Agency, Washington, DC	0	1,072	1Q	3,543	1Q	4,615
Government Travel		Missile Defense Agency, Washington, DC	0	934	2Q	677	2Q	1,611
SETA	C/FFP	MEI, Arlington, VA	0	7,644	1Q	7,287	1Q	14,931
KEI BMDS Interfaces	C/CPAF	Northrop Grumman, Arlington, VA	0	5,395	1Q	1,598	1Q	6,993
Sea Based	MIPR	NSWC/DD	0	3,500	2Q	4,320	2Q	7,820
Subtotal Support Costs			0	18,545		17,425		35970

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Systems Integration & Test			0	0	N/A	0	N/A	
Lethality	MIPR	Sandia National Lab, Abuquerque, NM	0	407	1Q	1,229	1Q	1,636
TOOs	MIPR	VAFB, Santa Barbara, CA	0	0	N/A	913	1Q	913

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation			0	407		2,142		2549

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services								

Remarks

Project Total Cost			0	201,933		386,300		588,233

Remarks

The Prime Contractor has the responsibility to balance resources across the KEI program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date: **February 2006**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**

R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Kinetic Energy Interceptors Knowledge Point Events																												
Stage 2 proof of concept static fire						△																						
Complete booster wind tunnel tests							△																					
Conduct fused ONIR-Radar fire control tests							△				△																	
Stage 1 proof of concept static fire								△																				
Stage 2 development motor static fire											△		△	△														
Stage 1 development motor static fire												△	△	△														
Conduct fused ONIR-Radar - STSS fire control tests															△													
Booster flight test #1																△												
Stage 1 design update static fire test																			△									
Stage 2 design update static fire test																			△									
Booster flight test #2																							△					
Kill vehicle integrated ground test																												△
Element Engineering																												

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲—▲	Complete Activity	△—△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Element Engineering																												
Complete multi-use performance assessment #2								▲																				
Concept design baseline update								▲																				
Generate final ECS and A-Spec											▲																	
TBSS												▲																
Complete multi-use performance assessment #3												▲																
Conduct element SDR												▲																
Conduct design review - 0																			▲									
Conduct design review - 1																									▲			
Interceptor																												
Static Fire 1st and 2nd stage rocket motors						▲	▲	▲																				
Booster wind tunnel test complete							▲																					
Booster Preliminary Design Review								▲																				
Booster rocket motor static test										▲	▲	▲	▲	▲														

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▲	Complete Activity	△▲△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interceptor																												
Booster Critical Design Review											△																	
Interceptor Component SDR												△																
Conduct booster flight #1																△												
Interceptor design review 0																			△									
Conduct booster flight #2																							△					
Conduct Partial Full Scale (PFS) test 4																											△	
Conduct Kill Vehicle Hover Test																												△
Fire Control and Communications																												
Demonstrate Radar-ONIR Fusion/Live Event											△																	
Demonstrate data fusion - Live Event											△																	
Demonstrate transmit antenna panel												△																
Demonstrate Radar -ONIR-STSS fusion															△													
Complete Design Review-0																			△									

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▬▲	Complete Activity	△▬△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Fiscal Year	2005				2006				2007				2008				2009				2010				2011			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Launcher																												
Conduct Launcher System Design Review												▲																
Launcher Design Review-0																			▲									
Conduct the Launcher Off-Road Mobility Test																					▲							
Deliver Pre-Production Launcher																								▲				
Integration and Test																												
Select Element Integration Facility site							▲																					
Select System Integration Facility site								▲																				
Initiate facility architecture and engineering										▲																		
Complete System Integration Lab facility																				▲				▲				
Complete Element Integration Lab facility																							▲					
Conduct Element Ground Test																							▲					
Conduct Integrated Ground Test																												▲
Government System Engineering & Program Management																												
Sea Mobile Alternatives Assessment					▲						▲																	
Support Boost/Ascent Reports to Congress						▲		▲																				
Complete transition of KI office to Huntsville, AL								▲																				

Legend

▲	Significant Event (complete)	△	Significant Event (planned)
★	Milestone Decision (complete)	☆	Milestone Decision (planned)
◆	Element Test (complete)	◇	Element Test (planned)
▼	System Level Test (complete)	▽	System Level Test (planned)
▲▬▲	Complete Activity	△▬△	Planned Activity

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Kinetic Energy Interceptors Knowledge Point Events							
Stage 2 proof of concept static fire		2Q					
Complete booster wind tunnel tests		3Q					
Conduct fused ONIR-Radar fire control tests		3Q	3Q				
Stage 1 proof of concept static fire		4Q					
Stage 2 development motor static fire			3Q	1Q-2Q			
Stage 1 development motor static fire			4Q	1Q-2Q			
Conduct fused ONIR-Radar - STSS fire control tests				3Q			
Booster flight test #1				4Q			
Stage 1 design update static fire test					3Q		
Stage 2 design update static fire test					3Q		
Booster flight test #2						3Q	
Element Integrated Ground Test - 1							2Q
Kill vehicle integrated ground test							4Q
Element Engineering							
Deliver KEI SIM Version 2.0		3Q					
Update element capability interface specifications		3Q					
Complete multi-use performance assessment #2		4Q					
Concept design baseline update		4Q					
Deliver KEI SIM Version 3.0			3Q				
Generate final ECS and A-Spec			3Q				
Complete KEI section of BMDS TBDD and TBSS			4Q				
Complete multi-use performance assessment #3			4Q				
Conduct element SDR			4Q				
Conduct design review - 0					3Q		
Conduct design review - 1							1Q
Interceptor							
Static Fire 1st and 2nd stage rocket motors		2Q-4Q					
Booster wind tunnel test complete		3Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Booster Preliminary Design Review		4Q					
Booster rocket motor static test			2Q-4Q	1Q-2Q			
Booster Critical Design Review			3Q				
Interceptor Component SDR			4Q				
Deliver booster flight #1 components				3Q			
Conduct booster flight #1				4Q			
Interceptor design review 0					3Q		
Conduct booster flight #2						3Q	
Deliver Booster Flight #2 Article						3Q	
Conduct Partial Full Scale (PFS) test 4							3Q
Conduct Kill Vehicle Hover Test							4Q
Deliver Control Test Vehicle (CTV) Article							4Q
Fire Control and Communications							
Conduct Algorithm/Timeline Demonstrations		3Q					
Demonstrate CKEI data fusion in shelter		3Q					
Demonstrate Radar-ONIR Fusion in Shelter		3Q					
Conduct algorithm/timeline demonstration - Live			3Q				
Demonstrate Radar-ONIR Fusion/Live Event			3Q				
Demonstrate data fusion - Live Event			3Q				
Demonstrate transmit antenna panel			4Q				
Direct Downlink Experiment - Live Event			4Q				
Establish integration lab			4Q				
Demonstrate Radar -ONIR-STSS fusion				3Q			
Complete component System Design Review				4Q			
Complete Design Review-0					3Q		
Deliver production representative component							3Q
Launcher							
Conduct Launcher System Design Review			4Q				
Launcher Design Review-0					3Q		
Conduct the Launcher Off-Road Mobility Test						1Q	
Deliver Pre-Production Launcher						4Q	

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

Schedule Profile	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Integration and Test							
Participate in Nimble Titan Wargame Exercise		3Q	3Q	3Q	3Q	3Q	3Q
Publish/Update Development Master Test Plan		3Q	4Q	4Q	4Q	4Q	4Q
Publish/Update Target Requirements Documentation		3Q	3Q	3Q	3Q	3Q	3Q
Publish/Update VV&A Plan		3Q	3Q	3Q	3Q	3Q	3Q
Select Element Integration Facility site		3Q					
Select System Integration Facility site		4Q					
Initiate facility architecture and engineering			2Q				
Conduct booster flight #1				4Q			
Complete System Integration Lab facility					4Q	4Q	
Complete Element Integration Lab facility						3Q	
Conduct Element Ground Test						3Q	
Conduct booster flight #2						3Q	
Conduct Partial Full Scale (PFS) Test							2Q
Conduct Integrated Ground Test							4Q
Government System Engineering & Program Management							
Sea Mobile Alternatives Assessment		1Q-4Q	1Q-3Q				
Support Boost/Ascent Reports to Congress		2Q-4Q					
Inputs to MBDS Master Integration Plan		3Q					
Complete transition of KI office to Huntsville, AL		4Q					
Deliver Boost/Ascent/Midcourse threat data package			2Q				
Generate KEI sections of TBDD & TBSS with MDA/SE			3Q				
Test bed description document and specification			3Q				
Government Integration and Test							
Target of Opportunity Data Analysis		3Q	3Q	3Q	3Q	3Q	3Q
Lethality sims boost/ascent long-range targets		4Q	4Q	4Q			

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	15,255	7,409	19,208	25,417	43,191	53,485	23,681
RDT&E Articles Qty	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, cost estimating, contracting, and financial management, to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions, as well as outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	15,255	7,409	19,208
RDT&E Articles (Quantity)	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date: February 2006
APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)	R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors

C. Other Program Funding Summary

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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PE 0603879C Advanced Concepts, Evaluations and Systems	166,996	0	0	0	0	0	0	166,996
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	914,063	1,198,860	1,037,203	878,540	615,005	731,692	482,362	5,857,725
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	4,487,253	2,489,257	2,605,567	2,444,109	2,065,344	1,979,612	1,617,059	17,688,201
PE 0603883C Ballistic Missile Defense Boost Defense Segment	472,543	490,863	632,028	567,493	493,842	615,859	988,731	4,261,359
PE 0603884C Ballistic Missile Defense Sensors	567,193	294,283	536,428	554,012	623,089	306,965	217,590	3,099,560
PE 0603888C Ballistic Missile Defense Test and Targets	700,570	632,107	692,209	614,174	649,766	668,624	678,105	4,635,555
PE 0603889C Ballistic Missile Defense Products	384,935	394,652	521,640	517,507	534,429	530,893	531,219	3,415,275
PE 0603890C Ballistic Missile Defense System Core	398,852	420,151	558,231	557,880	561,003	548,354	554,731	3,599,202
PE 0603891C Special Programs - MDA	0	324,522	421,303	836,168	1,110,695	1,027,677	1,260,497	4,980,862
PE 0603892C Ballistic Missile Defense Aegis	0	939,066	990,565	857,832	900,265	933,815	816,206	5,437,749
PE 0603893C Space Tracking & Surveillance System	0	239,998	361,515	429,679	640,367	787,008	818,606	3,277,173
PE 0603894C Multiple Kill Vehicle	0	83,000	220,370	273,805	307,566	309,284	115,119	1,309,144
PE 0603895C BMD System Space Program	0	0	0	45,000	150,000	166,000	206,100	567,100
PE 0605502C Small Business Innovative Research - MDA	138,907	0	0	0	0	0	0	138,907
PE 0901585C Pentagon Reservation	11,001	17,386	15,586	6,058	6,376	4,490	4,725	65,622
PE 0901598C Management Headquarters - MDA	110,662	99,327	89,314	86,821	86,244	70,600	70,714	613,682
PE Air Force Military Personnel	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
PE Air Force Operations and Maintenance	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
PE Air Force Other Procurement	0	2,400	1,453	11,279	386	17,710	25,709	58,937
PE Army Operations and Maintenance	49,597	66,974	68,246	69,809	71,472	73,325	75,230	474,653
PE Army Natl Guard Military Personnel	21,000	17,648	24,432	24,952	25,591	25,591	25,591	164,805
PE Army Natl Guard Operations and Maintenance	0	155	151	150	154	164	167	941
PE Navy Operations and Maintenance	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PE PAC-3/MEADS Missile Procurement	574,972	581,924	578,579	660,584	616,020	509,032	738,679	4,259,790
PE PAC-3/MEADS RDT&E	344,978	304,973	336,959	465,395	521,791	522,418	502,961	2,999,475